

REMARKS

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action of March 21, 2008. Claims 1-18, 19-21 and 25 are pending in the application. Claims 15, 17, 18, 20 and 25 have been amended. Claims 19 and 22-24 have been cancelled.

Reconsideration of the application is requested in view of the comments and amendments herein.

I. The Office Action

Claim 25 is objected to for ending in the word "and" and leaving out a step that was previously claimed in the original claims.

Claims 17, 19 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 23 is further rejected under 35 U.S.C. 101 for resulting in an improper definition of a process.

Claims 18 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Eagland et al. (US 2005/0189109).

Claims 1-5, 7, 8, 10-17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eagland et al. (US 2005/0189109) in view of Butler et al. (U.S. 5,407,009).

Claims 6, 9, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eagland et al. in view of Butler et al, and further in view of Waller et al. (U.S. 4,741,401).

Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eagland et al. in view of Butler et al. and Waller et al.

II. Objection to Claim 25

The Examiner objected to claim 25 for ending with the word "and" and apparently leaving out a step that was included in the claims as originally filed. Claim 25 has been amended correcting said mistake. Therefore, Applicants respectfully request the objection be withdrawn.

III. Rejection of Claims 17, 19 and 25 Under 35 U.S.C. 112, Second Paragraph

Claim 17, 19 and 25 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. With regards to claim 17, the Examiner states that there is insufficient antecedent basis for the limitation "said polymeric material" in line 2. Claim 17 has been amended to recite "said second polymeric material." Regarding claim 25, the Examiner asserts there is insufficient antecedent basis for "the first aspect" in lines 7-8. Claim 25 has been amended removing the phrases. With regards to claim 19, the claim has been cancelled; thereby making the rejection moot.

For at least the aforementioned reasons, claims 17 and 25 are now in condition for allowance. Therefore, the rejections should be withdrawn.

IV. Rejection of Claim 23 Under 35 U.S.C. 112, Second Paragraph and Further Under 35 U.S.C. 101

Claim 23 is rejected under 35 U.S.C. 112, second paragraph for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention; and further under 35 U.S.C. 101 for resulting in an improper definition of a process. Claim 23 has been cancelled, which renders the subject rejections moot.

V. Rejection of Claims 18 and 23 Under 35 U.S.C. 102(e)

Claims 18 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Eagland et al. Claim 23 is cancelled, thus the claim is no longer under consideration. Applicant respectfully traverses the rejection of claim 18.

The Examiner states that Eagland discloses a method of preparing a treatment fluid formulation comprising: selecting a first polymeric material and a second polymeric material as described in claim 1; and causing the formation of a third polymeric material by a reaction involving said first and second polymeric materials. Applicant asserts that claim 18 is dependent from and includes all the limitations of independent claim 1. The fact that independent claim 1 was rejected under 35 U.S.C. 103(a), supports the reasoning that Eagland fails to teach all of the limitations of the subject claim.

Claim 18 relates to a method of preparing a treatment formulation. The treatment formulation includes proppant and an encapsulated breaker means. These features make the treatment formulation of specific suitability for fracturing and for use in a method according to claim 1. As discussed further in Section VI with reference to claim 1, a skilled person faced with the problem with which the present invention is concerned, would not produce a treatment fluid formulation of the type described in claim 18. There is no motivation for a skilled person to provide a formulation from first and second polymeric materials of the type described, in a specified concentration range and in combination with a specified amount of proppant and with an encapsulated breaker. The cited art relates to fluids for EOR, which would not include proppants or breakers. Accordingly, a skilled person would not provide a formulation of the type described without the use of hindsight.

For at least the reasons set forth above, along with those addressed in Section VI, Eagland fails to teach or suggest the subject invention as recited in claim 18. Accordingly, the rejection should be withdrawn.

VI. Rejection of Claims 1-5, 7, 8, 10-17 and 22 Under 35 U.S.C. 103(a)

Claims 1-5, 7, 8, 10-17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eagland et al. (U.S. 2005/0189109) in view of Butler et al. (U.S. 5,407,009). Applicant respectfully traverses the rejection for at least the following reason. Eagland in view of Butler does not, individually or in combination, teach or make obvious the subject claims.

The Examiner asserts that Eagland discloses a method for recovering materials from a subterranean formation comprising the steps of contacting a subterranean formation with a treatment fluid formulation wherein the treatment fluid formulation comprises a third polymeric material which comprises a second polymeric material cross-linked by a first polymeric material, wherein said first polymeric material comprises a first polymeric material corresponding to formula (i) or (ii) as claimed. Applicant respectfully disagrees.

The problem addressed by the present invention is to provide a method of hydraulically fracturing a subterranean formation, including a treatment fluid formulation therefore. The treatment fluid formulation needs to be usable under challenging conditions of temperature and pressure. For instance, the challenge is to provide a formulation which can have a relatively high

viscosity at high pressure and temperature thereby to allow the necessary high forces to fracture a formation.

With respect to the aforementioned problem, it is respectfully submitted that Eagland provides no disclosure that would motivate a skilled person to adopt the formulation described therein in a method in accordance with the invention. Eagland is concerned with recovering materials in a tertiary oil recovery process, such as an "enhanced oil recovery" (EOR) process. This involves injecting a formulation into a formation. According to Eagland, "the formulation has viscosity and other physical and chemical properties which enable it to aid the release of oil from within the oil bearing formation and facilitate the transfer of hydrostatic forces to the oil to enable it to be pushed to the production well." [0073]. However, these features are not relevant to the process of the present invention. In particular, whereas EOR involves causing release of oil, for example, utilizing a surfactant-type effect between a chemical added and the oil/formation; fracturing, in accord with the present invention, is largely a physical process which involves high forces. Effectively, fracturing opens up the formation and allows oil to flow more freely.

In addition, in Eagland, the injected fluid is arranged to push oil towards a production well. In contrast, in fracturing, a treatment fluid formulation is forced, under high pressure, into a formation in a first direction. Once the formation has been fractured, and the treatment fluid formulation removed, then oil may flow in a second direction, opposite to the first direction. Thus effectively, in fracturing, the treatment fluid formulation is urged into the formation to fracture it so that the oil can flow back through fractured regions of the formation.

It is respectfully submitted that EOR and fracturing are very different techniques, requiring different chemicals, with different physical and chemical properties. While in EOR, chemical properties of any formulation used are important, in fracturing, physical properties, and more particularly, the performance of chemicals under demanding conditions of pressure and temperature are important.

The Examiner argues that although Eagland fails to explicitly teach hydraulically fracturing the formation by contacting the formation with the disclosed treatment fluid, by contacting the formation at a rate and pressure sufficient to produce or extend a fracture in the formation, Butler et al. teaches a method for recovery of hydrocarbons from a hydrocarbon deposit comprising an injection and production well therein, where, prior to injection of the

treatment material in the injection well and subsequent production from the producing well, the base of the deposit is hydraulically fractured by injection of water or other suitable fracturing fluid, thereby creating a permeable layer between the wells, for the purpose of subsequent recovery of produced hydrocarbons from the producing well. The Examiner further argues that it would have been obvious to one of ordinary skill in the art to employ the treatment fluid formulation of Eagland with a hydraulic fracturing treatment of the formation in order to establish a permeable pathway between the injection and producing therein.

Applicant respectfully disagrees with the Examiner's assertion of obviousness. As with Eagland, Butler describes an EOR process. The Examiner states that Butler discloses that "prior to injection of the treatment material in the injection well and subsequent production from the producing well, the base of the deposit is hydraulically fractured by injection of water or other suitable fracturing fluid, thereby creating a permeable layer between the wells, for the purpose of subsequent recovery of produced hydrocarbons from the producing wells." Applicant respectfully submits that all this passage effectively states is that the formations may be fractured using suitable fracturing fluids. It does not provide any teaching for a skilled person that the EOR fluids described in Eagland may in fact be used in fracturing in the manner described in accordance with the present invention. Butler also does not suggest that fracturing fluids and EOR fluids are interchangeable and such is not well known in the art. In fact, Butler is largely silent on the nature of the fracturing fluid and leaves it for a skilled person to select a known fluid.

For at least the aforementioned reasons, Eagland in view of Butler does not render the present invention unpatentable. Therefore, Applicant respectfully requests the rejection of independent claim 1 (along with claims 2-5, 7, 8, 10-17 that depend therefrom) be withdrawn.

VII. Rejection of Claims 6, 9, 24 and 25 Under 35 U.S.C. 103(a)

Claims 6, 9, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eagland et al in view of Butler et al., and further in view of Walles et al. (U.S. 4,741,401). Claim 24 has been cancelled and is therefore no longer being considered. The rejection of claims 6, 9 and 25 should be withdrawn for at least the following reasons. Eagland in view of Butler and further in view of Walles does not teach or suggest the subject invention as set forth in the subject claims.

With regard to claims 6 and 9, Applicant asserts that the claims include all the limitations and depend from claim 1 and are believed to be in condition for allowance for at least the reasons hereinbefore discussed with regard to claim 1. Walles does not make up for the aforementioned deficiencies of Eagland in view of Butler as set forth above. Therefore, withdrawal of the rejection is respectfully requested.

Independent claim 25 describes a method of recovering oil from a subterranean formation. This includes both a fracturing step (A) and a step whereby a breaker means lowers the viscosity of treatment fluid formulation to allow oil to flow (B)-(C). Applicants submit that a skilled person would not use the fracturing step for the reasons hereinbefore discussed with reference to claim 1. A skilled person faced with the problem with which the present invention is concerned would not be led to the solution set forth in the subject claims based on the current state of the art at the time the invention was made. Furthermore, there is no motivation for a skilled person to adopt a treatment fluid formation having the viscosity specified in claim 25. The claimed viscosities are important to fracturing, not EOR, which is the subject of Eagland and the other cited art.

The Examiner acknowledges that the combination of Eagland and Butler is silent with respect to the step of allowing a fractured area to close down whilst being propped up by a proppant, wherein as a result of said close down, a breaker means releases an active material which is arranged to lower the viscosity of the treatment fluid formulation of the first step. However, the Examiner asserts that Walles teaches a method for treating a subterranean formation wherein controlled release capsules comprising a breaker contained within an enclosure member are employed for the purpose of breaking a treatment fluid; the breaker contained within the enclosed member can be any solid or liquid material that does not adversely interact or chemically react with the enclosure member. The Examiner further reasons that since Walles also teaches that depending on the specific fracturing treatment, proppants may be included, it would have been obvious to one skilled in the art to include one or more proppants within the treatment fluid formulation as taught by Eagland when used in a hydraulic fracturing operation depending upon the actual conditions encountered in the field.

Applicant respectfully disagrees and asserts that the proposed combination of references does not disclose step (B) of the method. Walles teaches an injection step of a controlled release capsule. In accordance with the present invention, the viscosity of the

formulation at the temperatures at which fracturing takes place is sufficient to carry a breaker means and also to carry proppants. Such additives can be carried even when the treatment fluid formulation is subjected to high temperatures and pressure.

In light of the foregoing, Eagland in view of Butler and further in view of Walles does not, alone or in combination, teach or suggest the subject embodiment of claims 6, 9 and 25. Therefore, withdrawal of the rejection is respectfully requested.

VIII. Rejection of Claims 19-21 Under 35 U.S.C. 103(a)

Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eagland in view of Butler and Walles. Claim 19 has been cancelled; therefore, only claims 20 and 21 will be discussed. Applicant respectfully requests withdrawal of the rejection for at least the following reasons. Claims 20-21 depend from and include all the limitations of claim 1 and are believed to be in allowable condition for the reasons hereinbefore discussed with regard to claim 1. Walles does not make up for the aforementioned deficiencies of Eagland in view of Walles as set forth above. Therefore, Applicant respectfully requests withdrawal of the rejection.

CONCLUSION


For the reasons detailed above, it is respectfully submitted all claims remaining in the application (Claims 1-18, 19-21 and 25) are now in condition for allowance. The foregoing comments do not require unnecessary additional search or examination.

Respectfully submitted,


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September 22, 2008

Date



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